Quantum@SUN

South African Quantum Technology Initiative

NITheCS National Institute for Theoretical and Computational Sciences

Stellenbosch University iYunivesithi Universiteit

SEMINAR

Approximating classical kernels on NISQ computers

Rivan Rughubar (University of Cape Town)

Friday, 11 August 2023 @ 14h00 SAST
Venue: Physics Seminar Room, Stellenbosch University, and online

ABSTRACT

The talk will aim to demonstrate how a kernel function can be approximated on a NISQ computer and demonstrate the limitations of this method.

Kernel methods are used throughout classical and quantum machine learning. Over the last few years there has been exploration into the link between variational quantum circuits and the feature maps and kernels associated with them. Building quantum circuits which exactly implement a given kernel function has proved to be a nontrivial task. We will therefore look at a method for approximating kernel functions which can be implemented on NISQ computers. This method also attempts to avoid the black box problem in hopes that it can be iterated on and used to approximate a larger family of functions in the future.

BIOGRAPHY

Rivan completed an undergraduate degree in Physics and Computer Science as well as an honours degree in Physics at the University of Cape Town (UCT). He then finished an MSc at UCT under the supervision of Jonathan Shock, focusing on quantum machine learning. His thesis focused on kernel methods in classical and quantum learning, and how kernel methods could be applied to NISQ computers. He is about to begin a PhD at Research Centre Jülich in Germany. He hopes to return afterwards to further quantum computing research and education in South Africa.

REGISTER: http://bit.ly/3QsxUyf